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Notice Appeal
8-5-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Harif** §
Serial No.: **09/751,076** §
Filed: **December 29, 2000** §
For: **Wearable Keyboard Apparatus** §

Group Art Unit: **2673**
Examiner: **Piziali, Jeffrey J.**
Attorney Docket No.: **AUS920000946US1**

Certificate of Mailing Under 37 C.F.R. § 1.8(a)
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By: [signature]
Amelia C. Nearing

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Sir:
ENCLOSED HEREWITH:

- Appellant's Brief (in triplicate) (37 C.F.R. 1.192); and
- Our return postcard.

A fee of $320.00 is required for filing an Appellant's Brief. Please charge this fee to IBM Corporation Deposit Account No. 09-0447. No additional fees are believed to be necessary. If, however, any additional fees are required, I authorize the Commissioner to charge these fees which may be required to IBM Corporation Deposit Account No. 09-0447. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to Deposit Account No. 09-0447.

Respectfully submitted,

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Docket No. AUS920000946US1 *PATENT*

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ATTENTION: Board of Patent Appeals and Interferences

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By: Amelia C. Nearing

APPELLANT'S BRIEF (37 C.F.R. 1.192)

This brief is in furtherance of the Notice of Appeal, filed in this case on May 27, 2003.

The fees required under § 1.17(c), and any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief is transmitted in triplicate. (37 C.F.R. 1.192(a))

REAL PARTIES IN INTEREST

The real party in interest in this appeal is the following party: IBM Corporation

RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the pending appeal, there are no such appeals or interferences.

STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION

Claims in the application are: 1-20

B. STATUS OF ALL THE CLAIMS IN APPLICATION

1. Claims canceled: NONE
2. Claims withdrawn from consideration but not canceled: NONE
3. Claims pending: 1-20
4. Claims allowed: NONE
5. Claims rejected: 1-20

C. CLAIMS ON APPEAL

The claims on appeal are: 1-20

STATUS OF AMENDMENTS

No unentered amendments are present in the application.

SUMMARY OF INVENTION

The present invention provides a keyboard apparatus, which includes a fabric and switch units coupled to the fabric. See page 5, lines 7-10; page 6, lines 13-15. Each switch unit **500** includes a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid. See page 6, lines 16-21; page 7, lines 15-23; page 8, lines 3-12. Each switch unit **500** also includes a switch **506** coupled to the capsule; wherein a selected pressure applied to the capsule activates the switch. See page 8, lines 14-17. The keyboard apparatus also contains electrical conducting lines **508, 510** connected to the switch units. See page 7, line 29, to page 8, line 2.

ISSUES

The issues on appeal are as follows:

Whether claims 1, 3-5, 7-9, 12-15, 17, and 19 are unpatentable as being anticipated by Furusho et al. (US Patent No. 6,310,604) ("*Furusho*"); and

Whether claims 2, 6, 10, 11, 16, 18, and 20 are unpatentable as being obvious over Furusho et al.

GROUPING OF CLAIMS

The claims on appeal do not stand or fall in a single group, but are grouped into in the following groups for the reasons set forth in the Argument section below:

Claims 1 and 8-12 form group A. Claim 3 forms group B. Claims 4 and 17 form group C. Claim 5 forms group D. Claim 7 forms group E. Claims 13 and 15 form group F. Claim 14 forms group G. Claim 19 forms group H. Claim 2 forms group I. Claim 6 forms group J. Claims 16 and 18 form group K. Claim 20 forms group L.

ARGUMENT

The Office Action rejects claims 1, 3, 5, 7-9, and 12-15 under 35 U.S.C. § 102 as being anticipated by Furusho et al. (US Patent No. 6,310,604), hereinafter referred to as "*Furusho.*" This rejection is respectfully traversed.

I. The Prior Art Fails to Teach or Suggest a Keyboard Having a Plurality of Switch Units as Claimed (Groups A-E, H, and J)

As to claim 1, the Office Action states:

> Regarding claim 1, Furusho discloses a keyboard (see Column 16, Lines 20-27) apparatus comprising: a fabric [Fig. 17, 105] (see Column 14, Lines 22-35); a plurality of switch units [Fig. 19,2] coupled to the fabric, wherein each switch unit within the plurality of switch units includes: a capsule/sealed-unit containing an electrically responsive liquid [Fig. 19, 106], wherein the electrically responsive liquid causes the capsule to increase in rigidity/viscosity in response to application of an electric field to the electrically responsive liquid; a switch [Fig. 19, 2b] coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch; and a plurality of electrical conducting lines [Fig. 19, 138] connected to the plurality of switch units (see Column 14, Line 66 - Column 15, Line 35).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system including an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16,** and **19**. However, *Furusho* does not teach or suggest a keyboard, as recited in claim 1. The cited portion of *Furusho* states:

> Furthermore, the force display device in accordance with the present invention serves as one of the fundamental techniques of multimedia utilizing high speed networks; it serves as an input/output device of an information terminal like a mouse, keyboard, display or speaker, thereby making it possible to transmit information on haptic senses such as touch, grasp or rub in addition to the conventionally transmitted information like characters, images or voices.

Furusho, col. 16, lines 20-27. In other words, the force display device of *Furusho* is **like** a keyboard in that it is an input/output device. The force display device of *Furusho* makes it possible to transmit information on haptic senses such as touch, grasp or rub. However, the force

display device of *Furusho* is not, itself, a keyboard.

Furthermore, *Furusho* teaches an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity/viscosity in response to application of an electric field to the electrically responsive liquid. See *Furusho*, **FIG. 19**, **106**. However, as clearly shown in **FIG. 19**, the electrically responsive liquid is not part of an individual capsule within an individual switch unit. In the *Furusho* device, there is one body that contains the electrically responsive liquid and all sensors and electrodes are coupled to that same body. Therefore, *Furusho* does not teach or suggest a ***plurality*** of ***switch*** units, wherein ***each*** switch unit includes "a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid," "a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch," and "a plurality of electrical conducting lines connected to the plurality of switch units," as recited in claim 1.

Still further, *Furusho* does not teach or suggest a plurality of switch units, wherein each switch unit includes "a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch," as recited in claim 1. *Furusho* makes no mention of applying pressure to a capsule to activate a switch. In fact, the word "switch" does not even appear in *Furusho*. The container that holds the electrorheological fluid in *Furusho* is not a capsule and this container is not coupled to a switch. Moreover, *Furusho* does not teach or suggest that applying pressure to this container activates a switch.

The applied reference does not teach each and every claim limitation; therefore, claim 1 is not anticipated by claim 1. Independent claims 9 and 12 recite subject matter addressed above with respect to claim 1 and are allowable for the same reasons. Since claims 3, 5, 7, and 8 depend from claim 1, the same distinctions between *Furusho* and the invention recited in claim 1 apply for these claims. Additionally, claims 3, 5, 7, and 8 recite other additional combinations of features not suggested by the reference. Consequently, it is respectfully urged that the rejection of claims 1, 3, 5, and 7-9 is overcome.

Furthermore, *Furusho* does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Office Action pointing out some teaching or incentive to implement *Furusho* to make a keyboard or pointing device, one of

ordinary skill in the art would not be led to modify *Furusho* to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify *Furusho* in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Appellant's disclosure as a template to make the necessary changes to reach the claimed invention.

II. The Prior Art Fails to Teach or Suggest a Capsule for Each Switch Units and an Electrically Responsive Liquid Causes a Capsule to Expand When an Electrical Field is Applied (Group B)

More particularly, claim 3, the Office Action states:

> Regarding claim 3, Furusho discloses the liquid causes the capsule to expand when an electrical field is applied to the electrically responsive liquid (see Column 9, Lines 37-45).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. The cited portion of *Furusho* states:

> The electrorheological fluid **106** varies its viscosity in accordance with the intensity of the electric field. That is, the viscosity of the electrorheological fluid **106** filled in the space between the pins **104** and the holes **103** increases or decreases in response to the intensity of the electric field. Thus, the movement of the pins **104** can be freely controlled such as heavy or light movement by varying the flow resistance of the electrorheological fluid **106** with the electric field.

Furusho, col. 9, lines 37-45. Thus, *Furusho* teaches controlling the movement of pins by applying an electric field to the electrorheological fluid. However, nowhere does *Furusho* teach a capsule for each of a plurality of switch units, wherein an electrically responsive liquid causes the capsule to expand when an electrical field is applied, as recited in claim 3. *Furusho* does not teach that the container, in which the electrorheological fluid is held, is expandable. In fact, if the container in *Furusho* were expandable, then this would negate the control (heavy or light) of the pin movement. In other words, if the container in *Furusho* were allowed to expand, then this would work against controlling the flow resistance of the fluid. Therefore, *Furusho* does not teach or suggest "wherein the electrically responsive liquid causes the capsule to expand when an electrical field is applied to the electrically responsive liquid," as recited in claim 3.

III. The Prior Art Fails to Teach or Suggest a Fabric Being Integrated Within an Article of Wearing Apparel (Group C)

With respect to claim 4, the Office Action states:

> Regarding claim 4, Furusho discloses an article of wearing apparel (see Column 2, Lines 9-11).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system including an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7**, **8**, **16**, and **19**. However, *Furusho* does not teach or suggest a keyboard, as recited in claim 1. Therefore, if follows that the further limitation in claim 2 would not have been obvious given the teachings of *Furusho*. More specifically, the applied reference does not teach or suggest a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**, "wherein the fabric is integrated within an article of wearing apparel," as recited in claim 4. The prior art fails to teach or fairly suggest each and every claim limitation; therefore, claim 4 is not rendered obvious by *Furusho*.

Claim 17 recites subject matter addressed above with respect to claim 4 and is allowable for the same reasons. Since claims 16 and 18 depend from claims 4 and 17, respectively, the same distinctions between *Furusho* and the invention recited in claims 4 and 17 apply for these claims. Consequently, it is respectfully urged that the rejection of claims 4 and 16-18 is overcome.

IV. The Prior Art Fails to Teach or Suggest a Plurality of Switches Being Embedded Within a Fabric (Group D)

With respect to claim 5, the Office Action states:

> Regarding claim 5, Furusho discloses the plurality of switches is coupled to the fabric by being embedded within the fabric (see Fig. 17; Column 14, Lines 22-35).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. The cited figure illustrates parallel electrodes. The cited portion of *Furusho* states:

> In these figures, the thumb and fingers wear electrode units **150**, each of which comprises metallic film electrodes **138** and metallic parallel plate electrodes **139**. First ends of the metallic film electrodes **138** are connected to the backs of the fingers via metallic insulating portions **137**, and second ends thereof are

> deeply inserted into the spaces of the parallel plate electrodes **139**. The parallel plate electrodes **139** are provided with thin, insulating, synthetic nonwoven fabrics stuck to their surfaces which serve as spacers **105**. The spacers **105** insulate the metallic film electrodes **138** from the parallel plate electrodes **139**, and keep the spaces constant, as well. Furthermore, the electrorheological fluid **106** is filled in the spaces between the metallic film electrodes **138** and the parallel plate electrodes **139**.

Furusho, col. 14, lines 22-35. Thus, *Furusho* teaches a plurality of electrodes connected to the backs of fingers with nonwoven fabrics serving as spacers. However, *Furusho* does not teach or suggest "wherein the plurality of switches is coupled to the fabric by being embedded within the fabric," as recited in claim 5. The Office Action does not address this feature other than to point to the above cited portion. The Office Action is silent as to how electrodes with fabrics serving as spacers, as taught by *Furusho*, are somehow equivalent to a plurality of switch units, wherein each switch unit includes a switch and wherein the plurality of switches is embedded within a fabric, as in the claimed invention. The applied prior art does not teach this feature; therefore, claim 5 is not anticipated by *Furusho*.

V. The Prior Art Fails to Teach or Suggest a Number of Switch Units Having a Different Rigidity from Others (Group E)

With reference now to claim 7, the Office Action states:

> Regarding claim 7, Furusho discloses a number of the plurality of switch units have a different rigidity from the others in the plurality of switch units when an electric field is applied to the electrically responsive liquid (see Column 9, Lines 37-45).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. Again, the Office Action refers to a portion of *Furusho* that teaches controlling the movement of pins by applying an electric field to the electrorheological fluid. However, the Office Action proffers no analysis as to why this is equivalent to a plurality of switch units, wherein each switch unit includes a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid, and "wherein a number of the plurality of switch units have a different rigidity from others in the plurality of switch units when an electric field is applied to

the electrically responsive liquid," as recited in claim 7. *Furusho* does not teach or suggest the switch units recited in claim 1; therefore, it follows that *Furusho* fails to teach or suggest the further limitation in claim 7, wherein the switch units have different rigidity depending upon an applied electric field. *Furusho* simply does not teach or suggest switch units that are capable of having differing rigidity. Thus, claim 7 is not anticipated by *Furusho*.

VI. The Prior Art Fails to Teach or Suggest a Pointing Device (Groups F, G, and I)

With respect to claim 13, the Office Action states:

> Regarding claim 13, this claim is rejected by the reasoning applied in the above rejection of claim 1, furthermore Furusho discloses a pointing apparatus (see Column 16, Lines 20-28).

Office Action, dated February 26, 2002. Appellant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system in which an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16,** and **19**. However, *Furusho* does not teach or suggest a pointing device, as recited in claim 13. The cited portion of *Furusho* states:

> Furthermore, the force display device in accordance with the present invention serves as one of the fundamental techniques of multimedia utilizing high speed networks; it serves as an input/output device of an information terminal like a mouse, keyboard, display or speaker, thereby making it possible to transmit information on haptic senses such as touch, grasp or rub in addition to the conventionally transmitted information like characters, images or voices.

Furusho, col. 16, lines 20-27. In other words, the force display device of *Furusho* is **like** a mouse in that it is an input/output device. The force display device of *Furusho* makes it possible to transmit information on haptic senses such as touch, grasp or rub. However, the force display device of *Furusho* is not, itself, a pointing device that one would normally associate with a graphical user interface of an operating system having icons, etc. Moreover, the force display device of *Furusho* is not a pointing apparatus with switches, as recited in claim 13.

Furthermore, *Furusho* fails to teach or suggest "a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid," and "a

plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of the plurality of switches," as recited in claim 13. The applied prior art fails to teach or suggest each and every claim limitation; therefore, claim 13 is not anticipated by *Furusho*.

Since claims 14 and 15 depend from claim 13, the same distinctions between *Furusho* and the invention recited in claim 13 apply for these claims. Additionally, claims 14 and 15 recite other additional combinations of features not suggested by the reference.

VII. The Prior Art Fails to Teach or Suggest a Pointing Device Including a Capsule in a Shape of a Rectangle (Group G)

More particularly, with respect to claim 14, the Office Action states:

> Regarding claim 15, Furusho discloses the capsule being in the shape of a rectangle [Fig. 10, 116] (see Column 11, Lines 29-43).

Office Action, dated February 26, 2003. Appellant respectfully disagrees. The cited portion of *Furusho* states:

> **FIG. 10** is a schematic diagram showing a force display device used in EMBODIMENT 3 of a teleexistence system in accordance with the present invention. This embodiment is an example of a telereality system which operates a remote object with a robot grip. **FIG. 10** illustrates the operation principle of the force display device.
>
> The telereality system employs a hydraulic system using the electrorheological fluid **106** as a circulating liquid to control the direction and force of the piston output by the intensity of the electric field applied to the electrorheological fluid **106**, thereby displaying the piston output to a manipulator on the operator side as a force sense. In **FIG. 10**, the electrorheological fluid **106** is controlled such that it flows out of a pump **114**, circulates the Wheatstone bridge **115**, and returns to a tank **116**.

Furusho, col. 11, lines 29-43. Clearly, this embodiment in *Furusho* does not teach or suggest a pointing device that comprises a fabric and a switch unit coupled to the fabric, wherein the switch unit includes a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid, and a plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of

the plurality of switches, as recited in claim 13. Therefore, it follows that neither the cited portion nor any other portion of *Furusho* teaches or suggests the further limitation in claim 15, wherein the capsule is in a shape of a rectangle.

VIII. The Prior Art Fails to Teach or Suggest a Fabric Being Integrated Within an Article of Wearing Apparel (Group H)

With respect to claim 19, the Office Action states:

> Regarding claim 19, this claim is rejected by the reasoning applied in the above rejection of claim 4.

Office Action, dated February 26, 2003. Appellant respectfully disagrees. *Furusho* teaches a virtual reality and telereality system including a teleexistence system including an electrode unit that allows a user to grasp a virtual object. See *Furusho*, **FIGS. 7, 8, 16,** and **19**. However, *Furusho* does not teach or suggest a pointing device, as recited in claim 13. Therefore, if follows that the further limitation in claim 19 would not have been obvious given the teachings of *Furusho*. More specifically, the applied reference does not teach or suggest a pointing device comprising a fabric and **a switch unit coupled to the fabric**, "wherein the fabric is integrated within an article of wearing apparel," as recited in claim 19. The prior art fails to teach or fairly suggest each and every claim limitation; therefore, claim 19 is not rendered obvious by *Furusho*.

The Office Action rejects claims 2, 6, 10, 11, 16, 18, and 20 under 35 U.S.C. § 103 as being unpatentable over *Furusho*. This rejection is respectfully traversed.

Claims 2, 6, 10, 11, 16, 18, and 20 depend from claims 1, 4, 5, 9, 17, and 19; therefore, the same distinctions between *Furusho* and the invention recited in claims 1, 4, 5, 9, 17, and 19 apply for these claims. Thus, claims 2, 6, 10, 11, 16, 18, and 20 are allowable at least by virtue of their dependence on these claims. Additionally, claims 2, 6, 10, 11, 16, 18, and 20 recite other additional combinations of features not suggested by the reference.

IX. The Prior Art Fails to Teach or Suggest a Switch Being a Piezoelectric-Sensitive Component (Group I)

More particularly, with respect to claim 2, the Office Action states:

> Regarding claim 2, Furusho does not expressly disclose a piezoelectric-

sensitive component. However, the use of piezoelectric-sensitive components was well known and commonly understood in the field of switches, at the time of invention. Therefore, it would have been obvious to one skilled in the art at the time of invention to use a piezoelectric-sensitive component as Furusho's switch, so as to accurately sense applied force.

Office Action, dated February 26, 2003. Appellant respectfully disagrees. As stated above, *Furusho* does not teach a plurality of switches, as particularly recited in claim 1. In fact, the word "switch" does not even appear in *Furusho*. Therefore it follows that the further limitation in claim 2 of a switch being a piezoelectric-sensitive component would not have been obvious given the teachings of *Furusho*. The Office Action merely asserts that the specific limitation of claim 2 is somehow "well known and commonly understood in the field of switches" and concludes that it would have been obvious to modify *Furusho* to include piezoelectric-sensitive components without any support in the prior art and without *Furusho* even mentioning the word "switch."

The mere fact that a prior art reference can be readily modified does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Laskowski*, 871 F.2d 115, 10 U.S.P.Q.2d 1397 (Fed. Cir. 1989) and also *see In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992) and *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1993). The Office Action may not merely state that the modification would have been obvious to one of ordinary skill in the art without pointing out in the prior art a suggestion of the desirability of the proposed modification. In this case, *Furusho* does not even mentioning the word "switch." Therefore, a conclusion that it would have been obvious to use a piezoelectric-sensitive component as a switch can only be based on hindsight using Appellant's disclosure as a template for the necessary changes to arrive at the claimed invention.

X. The Prior Art Fails to Teach or Suggest a Fabric Including a Symbols Identifying the Switches (Group J)

Further, with respect to claim 6, the Office Action states:

Regarding claim 6, Furusho does not expressly disclose a plurality of symbols in locations on the fabric identifying the plurality of switches. However, the use of identifying symbols was well known and commonly understood in the field of fabrics, at the time of invention. Therefore, it would have been obvious to one skilled in the art at the time of invention to use identifying symbols on Furusho's glove, so as to assist the use in properly wearing (distinguishing

between the left and right hand, for instance) and using the glove.

Office Action, dated February 26, 2003. Appellant respectfully disagrees. Again, the applied reference does not teach or suggest a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**. Therefore, it follows that *Furusho* does not teach or fairly suggest the further limitation of "wherein the fabric includes a plurality of symbols in locations on the fabric identifying the plurality of switches," as recited in claim 6. The Office Action does not address this limitation other than to conclude that the feature would have been obvious "so as to assist the use in properly wearing (distinguishing between the left and right hand, for instance) and using the glove." Symbols that distinguish between a right and left hand are not equivalent to symbols "identifying the plurality of switches."

The Office Action may not make modifications to the prior art using the claimed invention as a model for the modifications. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780, 1783-1784 (Fed. Cir. 1992). "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art has suggested the desirability of the modification." *Id.* In other words, unless some teaching exists in the prior art for the suggested modification, merely asserting that such a modification would be obvious to one of ordinary skill in the art is improper and cannot be used to meet the burden of establishing a *prima facie* cases of obviousness. Such reliance is an impermissible use of hindsight with the benefit of Appellant's disclosure.

Therefore, absent some teaching, suggestion, or incentive in the prior art, *Furusho* cannot be properly modified to form the claimed invention. As a result, absent any teaching, suggestion, or incentive from the prior art to make the proposed modifications, the presently claimed invention can be reached only through the an impermissible use of hindsight with the benefit of Appellant's invention as a model.

XI. The Prior Art Fails to Teach or Suggest Wearing Apparel Being an Apron or a Pair of Pants (Groups K and L)

With respect to claims 16, 18, and 20, the Office Action states:

> Regarding claim 16, Furusho does not expressly disclose an apron or a pair of pants. However, the use of aprons and pants was well known and commonly understood in the field of fabrics, at the time of the invention. Therefore, it would

have been obvious to one skilled in the art at the time of invention to use an apron and/or pants with Furusho's glove (see Column 2, Lines 10-15), so as to comfortably store the apparatus.

Regarding claim 18, this claim is rejected by the reasoning applied in the above rejection of claim 16.

Regarding claim 20, this claim is rejected by the reasoning applied in the above rejection of claim 16.

Office Action, dated February 26, 2003. Appellant respectfully disagrees. As stated above with respect to claim 4, the applied reference does not teach or suggest a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**, "wherein the fabric is integrated within an article of wearing apparel," as recited in claim 4. Therefore, it follows that *Furusho* fails to teach or suggest the further limitation that the article of wearing apparel is one of an apron and a pair of pants, as recited in claims 16 and 18.

Furthermore, simply placing the glove of *Furusho* into a pocket of an apron or pair of pants does not result in a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**, wherein the fabric is integrated within an apron or pair of pants, as recited in claims 16 and 18. The applied reference fails to teach or suggest each and every claim limitation; therefore, claims 16 and 18 cannot be rendered obvious over *Furusho*.

As stated above with respect to claim 19, the applied reference does not teach or suggest a pointing device comprising a fabric and **a plurality of switch units coupled to the fabric**, "wherein the fabric is integrated within an article of wearing apparel," as recited in claim 19. Therefore, it follows that *Furusho* fails to teach or suggest the further limitation that the article of wearing apparel is one of an apron and a pair of pants, as recited in claim 20.

Furthermore, simply placing the glove of *Furusho* into a pocket of an apron or pair of pants does not result in a keyboard comprising a fabric and **a plurality of switch units coupled to the fabric**, wherein the fabric is integrated within an apron or pair of pants, as recited in claim 20. The applied reference fails to teach or suggest each and every claim limitation; therefore, claim 20 cannot be rendered obvious over *Furusho*.

XII. Conclusion

In view of the above, Appellant respectfully submits that the rejections of claims 1-20 are overcome. Accordingly, it is respectfully urged that the rejections of claims 1-20 not be sustained.

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APPENDIX OF CLAIMS

The text of the claims involved in the appeal reads:

1. A keyboard apparatus comprising:

a fabric;

a plurality of switch units coupled to the fabric, wherein each switch unit within the plurality of switch units includes:

a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid;

a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch; and

a plurality of electrical conducting lines connected to the plurality of switch units.

2. The keyboard apparatus of claim 1, wherein the switch is a piezoelectric-sensitive component.

3. The keyboard apparatus of claim 1, wherein the electrically responsive liquid causes the capsule to expand when an electrical field is applied to the electrically responsive liquid.

4. The keyboard apparatus of claim 1, wherein the fabric is integrated within an article of wearing apparel.

5. The keyboard apparatus of claim 1, wherein the plurality of switches is coupled to the fabric by being embedded within the fabric.

6. The keyboard of claim 5, wherein the fabric includes a plurality of symbols in locations on the fabric identifying the plurality of switches.

7. The keyboard apparatus of claim 1, wherein a number of the plurality of switch units have a different rigidity from others in the plurality of switch units when an electric field is applied to the electrically responsive liquid.

8. The keyboard apparatus of claim 1, wherein the electrically responsive liquid is an electrorheological fluid.

9. A keyboard comprising:

a fabric;

a plurality of switch units couple to the fabric, wherein each switch unit includes:

a sealed unit containing an electrically responsive liquid;

a switch, wherein the electrically responsive liquid in each switch unit increases in viscosity in response application of an electric field to the electrically responsive liquid; and

a plurality of electrical conducting lines connected to the plurality of switch units and an output configured for connection to a data processing system.

10. The keyboard of claim 9, wherein the output is a wireless transmitter.

11. The keyboard of claim 9, wherein the output is a universal serial bus connector.

12. A data processing system comprising:

a bus system;

a memory connected to the bus system, wherein a set of instructions are located in the memory;

a processor unit connected to the bus system, wherein the processor unit executes instructions; and

a keyboard connected to the bus system, wherein the keyboard is embedded in a fabric and includes:

a plurality of switch units attached to the fabric, wherein each switch unit within the plurality of switch units includes:

a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid;

a switch coupled to the capsule, wherein a selected pressure applied to the capsule activates the switch; and

a plurality of electrical conducting lines connected to the plurality of switch units.

13. A pointing apparatus comprising:

a fabric; and

a switch unit coupled to the fabric, wherein the switch unit includes:

a capsule containing an electrically responsive liquid, wherein the electrically responsive liquid causes the capsule to increase in rigidity in response to application of an electric field to the electrically responsive liquid; and

a plurality of switches coupled to the capsule, wherein a selected pressure applied to a portion of the capsule activates one or more of the plurality of switches.

14. The pointing apparatus of claim 13, wherein activation of one or more of the plurality of switches generates signals to control a pointer on a display of a data processing system.

15. The pointing apparatus of claim 13, wherein the capsule is in shape of a rectangle.

16. The keyboard apparatus of claim 4, wherein the article of wearing apparel is one of an apron and a pair of pants.

17. The keyboard of claim 9, wherein the fabric is integrated within an article of wearing apparel.

18. The keyboard of claim 17, wherein the article of wearing apparel is one of an apron and a pair of pants.

19. The pointing apparatus of claim 13, wherein the fabric is integrated within an article of wearing apparel.

20. The pointing apparatus of claim 19, wherein the article of wearing apparel is one of an apron and a pair of pants.